Chapter 2: Defining and Measuring Material Hardship

One of the primary challenges in measuring material hardship is the lack of a commonly accepted definition of material need or standard approach to its measurement. Most domestic researchers interested in material hardship have built upon earlier work by Mayer and Jencks (1989) in which they constructed a hardship index that included various indicators of material need. However, despite this common reference point, there remains considerable disagreement among researchers as to how to define and measure material hardship.

In response to this situation, discussants at the Roundtable Meeting recommended undertaking additional definitional and theoretical work that focuses on what is meant by material hardship and how it could be measured in the context of low-income families and children. This chapter responds to this recommendation by: 1) summarizing some of the literature on the related concepts of poverty and deprivation; and 2) discussing some of the challenges that must be overcome to develop a commonly accepted definition of material hardship and corresponding measurement strategies.

Poverty, Deprivation, and Material Hardship

Poverty is a multidimensional phenomenon and as a result may be conceptualized and measured in different ways. For example, in her presentation at the Roundtable Meeting, Susan Mayer made the following observations: "material hardship is not necessarily synonymous with poverty" and "hardship measures are not the same as income measures." These comments reflect the fact that researchers and the public oftentimes do not differentiate between the terms 'poverty,' 'deprivation,' and 'hardship.' The confusion among these terms is a sign of both the interrelationship among these concepts and the fact that people often assign different meanings to these words.

Citro and Michael (1995) describe economic poverty as the extent to which households experience a "low level of material goods and services ***or*** a low level of resources to obtain these goods and services" (p. 21, emphasis added). These two forms of economic poverty are conceptually quite different; one focuses on the *lack of resources*, most often measured in terms of income, and the second on the lack of goods and services, or *deprivation*. Short (2003) takes this distinction one step further by distinguishing between income poverty and non-income poverty, or deprivation measures.

In the following sections we contrast resource- or *income-based poverty measures* with those that measure *deprivation*, which include measures of material hardship.

Resource- and Income-based Poverty Measures

People experience *subsistence poverty* "if they do not have the resources which are deemed necessary to achieve a certain minimum level of consumption" (Ringen, 1995, p. 353). The official US poverty statistic is an example of such a subsistence, or resource-based, poverty measure. Specifically, this measure uses poverty thresholds to identify families with incomes too low to purchase basic necessities (Citro & Michael, 1995). These thresholds, originally developed by Mollie Orshansky of the Social Security Administration, are based on the cost of a minimum diet and a multiplier that

accounts for other expenses. The thresholds are adjusted annually to reflect changes in consumer prices. Given the widespread use of the US poverty measure, most Americans have come to think of poverty in terms of an income-based definition.

Deprivation Poverty Measures

In contrast, Ringen (1995) defines *deprivation poverty* "in relation to how [people] in fact live" and "as a standard of consumption which is below what is generally considered to be decent minimum" (p. 354). Similarly, Sen (1979) noted that poverty might be identified through either income or *direct* approaches, where direct measures describe the extent to which people meet their needs after having made use of the resources at their disposal. The direct approach and income methods result in two alternative concepts of poverty, not two ways of measuring the same thing (Sen, 1981, in Short, 2003). Both consumption and material hardship measures, which focus on the goods and services consumed, are examples of direct measures. While poverty and deprivation are related concepts, a person could suffer from either poverty or deprivation alone. For example, a person lacking income could be well fed and housed through in-kind donations, while a person with regular income could be poorly fed and have inadequate shelter due to their inability to manage a budget.

Deprivation poverty measures and the use of direct measures have received considerably more attention by researchers in Europe and Great Britain than US researchers. As discussed below, European definitions of deprivation poverty generally represent a broader concept (i.e., social deprivation) than the American emphasis on material hardship. Also, more of the European measures have been grounded in socially-defined needs (e.g., some measures have been based on national survey data that identify what the public considers to be necessities).

Social Deprivation

European measures of social deprivation include social necessities as well as physical necessities (Fisher, 2001; Short, 2003). This general definition of deprivation was strongly influenced by the work of Townsend (1979), who created an index of 12 indicators of "deprivation," which included 6 items related to physical necessities (e.g., household without refrigerator; gone without a cooked meal for one or more days within the past two weeks) and 6 items related to social activities (e.g., a one week holiday away from home in the last 12 months; a relative or friend to the home for a meal; child's friends over to play). Conceptually, Townsend defined poverty in terms of *relative deprivation*, where families "can be said to be in poverty when they lack the resources to…have the living conditions and amenities which are customary, or at least widely encouraged or approved" (p. 31, in Fisher, 2001).

Mack and Lansley (1985) built on Townsend's work in the Breadline Britain survey. Here, they defined poverty as "an enforced lack of socially perceived necessities" (p. 45). As was the case with Townsend, their necessities included both personal consumption items and social activities. Their definition, however, differed from Townsend's work in two important ways (Fisher, 2001; Short, 2003). First, they chose indicators of deprivation that were based on a national survey that asked respondents to classify a series of items as necessities or non-necessities. Second, they asked survey respondents who reported that they did not have a specific item whether this was because it was something they did not want *or* it was something they wanted, but could not afford.

Fisher (2001) applies the term "consensual deprivation indicator" to Mack and Lansley's approach, given its grounding in socially defined need. This approach has subsequently been used in surveys conducted in other European countries. For example, the work of Irish researchers (e.g., Callahan, Nolan, and Whelan, 1993) examines households that experience basic deprivation using indicators drawn from Mack and Lansley's initial work *and* fall below specific income thresholds.

Measures of Material Hardship

US measures of material hardship are narrower in focus than European measures of social deprivation. Generally speaking, material hardship measures only look at material needs and consumption items, which are closely equated with physical necessities (Fisher, 2001). As noted by Exhibit 2.1, most domestic material hardship studies use direct measures of hardship experiences or actual living conditions (Bauman, 1998; Danziger et al, 2000; Edin & Lein, 1997; Federman et al., 1996; Lerman, 2002a; Mayer & Jencks, 1989; Rector et al., 1999; Short & Shea, 1995). Although Beverly (1999a) defines hardship as, "inadequate *consumption* of very basic goods and services," the measures used to describe hardship actually focus on household experiences and living conditions (e.g., food insufficiency, housing quality), rather than consumption in relationship to need.

Despite their common focus on actual living conditions and physical needs, researchers conducting material hardship research in the US have struggled with establishing a common definition of material need. Unlike the consensual deprivation indicator approach, items included in these studies have been selected by researchers and have not been validated by social surveys where the general population identified which items constitute necessities and which do not. That said, researchers such as Mayer and Jencks (1989) and Beverly (1999a) have grounded their selection of measures in the policy literature and have chosen items that are directly linked to domestic social policy initiatives such as housing, food, and income support programs. That said, participants at the Roundtable Meeting agreed that material hardship is not a "neutral social scientific term." As a result, material hardship may mean different things to different people.

Similar to European measures of social deprivation, however, most domestic studies use an index with a specified threshold to identify households that experience hardship. In many cases this index also is compared to the official poverty threshold or other income-based poverty measures. This is usually to offer alternative estimates of those in need to poverty estimates promulgated using the official poverty measure or to show how different types of households can be identified using different measures.

Exhibit 2.1

Definitions Used to Describe Material Hardship in US Research

Author	Definitions
Bauman (1998)	Uses ***direct*** measures of economic well being to keep track of ***how people are getting by***
Beverly (1999a)	Inadequate ***consumption*** of very basic good and services such as food, housing, clothing, and medical care.
Danziger et al. (2000)	Recent ***experiences of material hardship*** and financial strain
Edin & Lein (1997)	Items that virtually every American would consider ***necessities; Living conditions*** below a standard most Americans would consider adequate
Federman et al. (1996)	Summarizes ***living conditions*** of individuals living in poor and non-poor families
Lerman (2002a)	General and specific ***problems in making ends meet*** as well as the availability of ***outside help to meet basic needs***
Mayer & Jencks (1989)	Uses direct measures to examine severity of household's ***hardship experiences***
Rector et al. (1999)	***Actual material living conditions***
Short & Shea (1995)	Inability to meet ***basic needs***

Conceptual Challenges in Defining Material Hardship

Researchers face a number of conceptual challenges in defining material hardship: 1) whether to measure "absolute" or "relative" material need; 2) what process should be used to determine material needs; and 3) what role should be played by individual choice and personal preferences. We discuss these themes below and consider their implications for measuring material hardship.

Absolute *versus* Relative Needs

Material needs may be defined in either absolute or relative terms. *Absolute* material needs are those that are *universal*, or *fixed*, for everyone in the population, while *relative* material needs are those that may *vary depending on circumstances* or norms (Ravallion, 1994).[2]

Based on research in developing countries, some analysts argue that there is an "irreducible core" (Sen, 1979) of *absolute basic needs* that are closely linked (theoretically and empirically) to a physiological interpretation of those things that are vital to human survival: "minimum specified quantities of such things as food, clothing, shelter, water, and sanitation that are necessary to prevent ill-health, undernourishment and the like" (Streeten, 1981, p. 25).

In contrast, *relative needs* are those "things that established rules of decency have rendered necessary" ([Adam] Smith, 1776, quoted in Sen, 1979, p. 288). In this case, the standard of need may vary depending on two factors – social wealth and context. As a society gets "richer" the relative standard of need changes to reflect societal wealth. For example, 75 years ago no one would have considered a telephone to be a necessity. However, today, given the almost universal access to telephones and the important role access to a telephone plays in people's ability to function in daily life, it could be argued that not having a telephone is a material hardship. Needs also are contextual. Basic needs or a minimum living standard might vary by region of the country or urban *versus* rural settings. Even for an absolute material need such as food, a threshold may be set in relative terms, far above the physiological minimum but corresponding to a view as to what people "should" have.

Despite the benefits of a relative standard of need that reflects social wealth and context, it could be argued that defining need in absolute or near-absolute terms has several advantages.

1. An absolute standard is more likely to remain relevant across individuals, time and place;
2. Measures that assess whether people meet their very basic material needs may be more easily linked to short- and long-term outcomes; and,
3. People are less likely to voluntarily forego opportunities to meet their very basic needs, which means that these needs are more likely to be universally applicable (Beverly, 1999b).

Process for Determining Material Needs

The discussion of absolute and relative needs and corresponding minimum standards points us towards several potential processes for identifying which experiences or shortages constitute a material hardship.

[2] It is important to note that some researchers (e.g., Townsend, 1979, pp. 37-38) disagree about the existence of a fundamental difference between absolute and relative needs.

Scientific Research

One approach would be to rely on scientific research that relates hardship to physical necessities. For example, scientific evidence may show that caloric intake below a specified level leads to certain adverse medical conditions. While this process may most readily support basic physiological needs and their effect on medical outcomes, one could imagine social science research advancing to the point where there is a credible body of evidence-based research showing that similar shortages in other goods and services result in negative social outcomes.

Societal Consensus

Another process, similar to the process used in some European contexts, is to develop societal consensus on what needs are important enough to be considered hardships if they are not met. Obtaining the data necessary for such a consensus, however, is a challenging task. As discussed above, there is precedent for developing this type of standard using public opinion surveys (e.g., Townsend, 1979; Mack & Lansley, 1993), and Donnison (1988) clearly outlines a research approach that could be executed to capture this information domestically. Nonetheless, this has not previously been done in the US.

How the Measure Will Be Used

Roundtable Meeting participants observed that the process of determining what constitutes a material need should be conditioned on the purpose for which the material hardship measure will be used. For example, what is included in a hardship measure may differ depending on whether it will be used for research, monitoring, or policymaking purposes. Similarly, participants spoke of the need to understand the role behind the underlying reasons for hardship and how "need" is defined. For example, if measures focus only on self-defined needs, we may miss key elements or overstate the level of hardship experienced. The group also was concerned with whether an absolute boundary between hardship and non-hardship exists. The group's consensus was that if there was a "true" boundary, research should be focused on "finding" or defining this boundary. Alternatively, if the boundary between hardship and non-hardship is arbitrary, it probably should be determined by public consensus.

Link to Negative Outcomes

For now, domestic researchers who study material hardship generally use existing social science research on which needs left unmet will likely to lead to negative outcomes *and* their perceptions of what the American public would consider a "hardship." This hybrid approach is consistent with what most Roundtable Meeting participants thought was the best strategy for identifying material needs. This has resulted in material hardship thresholds that consistently equate need at the lowest level with the ability to meet basic physiological needs – such as a minimum level of things such food, clothing and shelter that are required for physical functioning (e.g., Bauman, 1998; Bauman, 2002b; Beverly, 1999a; Federman et al., 1996; Mayer & Jencks, 1989; Rector et al., 1999). This physiological approach to defining need is most consistent with the notions that an absolute or near-absolute standard exists and that scientific research can be used to identify basic needs. In contrast, there may be other measures that fit better with the principle of relative need and a process of socially defined necessities.

Role of Individual Choices and Social Norms

The role of individual preferences and social norms also should be considered when defining and interpreting material hardship. Ravallion (1994) notes the difference between the "welfarist" (choice-based) and "non-welfarist" (norm-based) approaches.

> [Welfarism] aims to base comparisons of well-being, and public policy decisions, solely on individual 'utilities' – the preferences of individuals themselves – while [non-welfarism] typically prefers to base assessments on certain elementary achievements, such as being able to afford to be adequately nourished or clothed, and may pay little or no regard to information on utilities *per se*. (p. 4)

The choice-based approach, or welfarism, assumes that rational people can and will make choices that maximize their individual well-being, regardless of whether their choices are consistent with a societal, or norm-referenced, standard. In contrast, the norm-based approach (non-welfarism) assumes that there is some bundle of basic needs or commodities that form a *minimum standard* that applies to everyone regardless of preferences. For example, societal norms may say that indoor plumbing is a minimum necessity, but an individual may voluntarily forego this "necessity" to live in a remote cabin in the woods because he would rather live in an isolated place than have indoor plumbing. A welfarist would judge that the individual is better off for doing so; a non-welfarist, that the individual is worse off.

The norm-based (non-welfarist) approach reflects much of what has been done in resource economics and research in developing countries, where a minimum standard of basic need is identified for a population and an assessment is made of the extent to which that population falls below these minimum standards. In the US, however, virtually no one must go without the very barest necessities that are literally essential to sustain life. At the higher thresholds used in domestic analyses of material need, households may plausibly choose to make trade-offs or forego what are called "necessities" (indoor plumbing, a working automobile, a visit to the doctor) for reasons other than lack of resources.

Implications for Defining Material Hardship

These three themes and the earlier distinction between resource-based (e.g., income) and deprivation poverty measures suggest an approach for developing a common definition of material need and identifying a standard below which people experience material hardship. For the purpose of measuring material need we are less interested in indirect assessments of available resources than in the *direct assessment* of the extent to which people have the intrinsic goods they need, after having made use of the resources at their disposal.

Additionally, there is some logic in *minimizing the role played by individual choice and preferences* when defining material need. One purpose of a material hardship measure is to supplement the existing US poverty statistic, which already measures resource availability and accounts for individual preferences and choice. Nonetheless, collecting data that shows whether a need is not being met due to lack of resources, rather than personal preferences or other circumstances, would strengthen the claim that a *hardship* already exists. We also are most interested in learning whether people succeed in meeting a given set of socially-defined needs, regardless of individual choice.

One way to minimize the role of individual choice and personal preference is to focus on needs that are closer to "absolute" rather than to "relative" needs. Focusing on a core set of very basic needs, which are fairly closely related to physiological functioning, has the additional value of emphasizing needs about which there are fewer disagreements as to what constitutes a hardship. Absolute material needs also have the most applicability across population segments. It is difficult, however, to define needs with no consideration of the context of the society in which people live, and so some consideration of relative needs may be useful. In addition, it may be possible and valuable to develop measures that differ for families in different situations, just as the federal poverty measure varies by family size and food security is calculated differently for households with and without dependent children.

Finally, several researchers at the Roundtable Meeting advised working on both improving scientific knowledge (regarding which hardships cause negative outcomes) and developing societal consensus (especially in specifying socially-defined needs beyond the bare minimum required for survival) as future steps towards refining the definition and conceptual understanding of material hardship.

Measurement and Analytical Challenges

As described above, it has been possible for researchers who examine need and hardship in developing countries to reach broad agreement on a common set of material needs that are essential to survival – basic levels of shelter accommodations, medical care, food, clothing and sanitation (e.g., Ravallion, 1998; Sen, 1987; Streeten, 1981, 1984). Researchers in the US have used much higher standards and included items that reflect societal norms, which might not be considered "essential" in other contexts. Allowing for these variations in researchers' views as to what constitutes a material need and a corresponding threshold for identifying material hardship, there are other aspects of measurement and analysis that require consideration. These include:

- Choosing appropriate constructs for measuring need;
- Selecting reliable and valid measures; and,
- Deciding how to summarize a wide array of potential measures into a smaller, more manageable number of measures, or possibly a scale or index.

In the following sections, we discuss these issues and identify possible strategies for overcoming these challenges.

Identifying Underlying Constructs of Needs

As part of the preparation for the Roundtable Meeting, Bauman (2002b) proposed a framework that describes how consumption and needs relate to overall family economic functioning. The framework extends a basic "means" and "ends" dichotomy to include four stages: 1) *inputs,* or resources such as income, assets, public goods; 2) *technology,* such as the ability to manage resources wisely, as well as other abilities and skills, including coping mechanisms; 3) *consumption and needs*, which considers consumption relative to needs; and 4) *outcomes,* which includes both short- and long-term outcomes.

In measuring material hardship, the primary interest is in assessing people's actual material living conditions, and not how they come by these conditions. Thus, constructs that capture information

about the resources available to people or their ability to use resources to meet their material needs are not a good fit. For example, questions that ask whether people have enough money to pay bills or have health insurance assess the means people have at their disposal to meet their material needs, rather than indicating whether the material need itself has been met.

At the first level of consumption are those basic needs, or necessities, such as "food, clothing and shelter" (Bauman, 2002b). Beyond that, there are the other basic items that people need to function in society (e.g., clothing that meets acceptable social standards). In general, the strategy of assessing consumption relative to need is the same for various types of needs. It requires: 1) setting a standard or need (e.g., caloric intake); 2) measuring actual consumption; and 3) comparing it to this standard.

Alternatively, we can assess the degree to which people have met their material needs by looking at short- and long-term outcomes. Short-term outcomes could be material comforts or the degree to which basic needs are met, such as food insecurity and housing quality measures. Long-term outcomes could be lasting malnutrition or unemployment that can result from sustained material need over time. In either case, what is being measured is whether the desired outcome has been met.

Thus, two practical strategies for measuring material need or hardship can be drawn from the consideration of Bauman's framework: measuring consumption in relation to need and looking at short-term outcomes. Long-term outcomes are generally more difficult to measure using static, point-in-time measures, although there are exceptions, such as physiological measures of malnutrition that would reveal sustained food hardship over time. Juxtaposing these strategies with existing research on basic needs and material hardship, as well as ethnographic work with low-income families, suggests a range of possible constructs that may be appropriate for material hardship measurement. For example, as seen in Exhibit 2.2, most studies of material hardship have included a very similar set of constructs in their measurement. Of these constructs, the following specifically measure short-term outcomes and consumption patterns (related to need):

- Food security;
- Housing – Quality, Overcrowding, and Security;
- Unmet medical need; and
- Access to consumer durables.

These constructs also are featured in Beverly's (2001) list of recommended hardship indicators, which include: food, housing, utilities, medical, clothing, and consumer durables. (See Exhibit 2.2) These results suggest a trend toward a core set of constructs that measure material need. (Chapter 3 includes a more thorough discussion of the domains included in current research on material hardship.)

Exhibit 2.2

Domains Measured in Several US Surveys and Studies

									SIPP-Related Studies of Material Hardship				
	SIPP (1991, 1993, 1996)	NSAF (1999)	(Mayer & Jencks, 1989)	(Edin & Lein, 1997)	Moving to Opportunities (MTO) (2001)	AHS & Gundersen (1996)	Urban Change (1998)	Women's Employment Survey (Danziger et al., 2000)	(Bauman, 1998)	(Federman et al., 1996)	(Beverly, 1999a)	(Rector et al., 1999)	(Boushey & Gundersen, 2001)
Insufficient Food	X	X	X	X	X		X	X	X	X	X	X	X
Housing-Quality	X*		X	X	X	X	X			X	X	X	
Housing Crowding	X*	X	X		X	X	X			X		X	
Housing Security	X		X	X	X		X	X	X	X	X	X	X
Difficulty Affording Basic Necessities	X	X	X	X	X		X	X	X	X	X	X	
Unmet Medical Need/Access to Medical Care/Health Insurance Coverage	X	X	X	X	X		X	X	X		X	X	X
Access to Consumer Durables	X*									X		X	

*Domain omitted in 1993.

Criteria for Selecting Measures

In addition to identifying what constructs should be measured, researchers must select reliable and valid measures. In separate works, Beverly (2001), Citro & Michael (1995), Bauman (1998), and Moore (1997) suggest criteria researchers may use when selecting existing measures or developing new measures of material hardship. (Exhibit 2.3 provides a complete list of each set of proposed criteria.)

While Beverly (2001) and Bauman (1998) are the only authors that propose criteria specifically for material hardship measurement, the criteria proposed by Citro & Michael (1995) and Moore (1997) for selecting poverty measures and indicators of child well-being, respectively, also have considerable applicability to material hardship measurement.

Bauman, Citro & Michael, and Moore's criteria have several common threads:

- ***"Public acceptability," "Face validity," and "Clear and comprehensible"***
  In recommending criteria, Citro & Michael, Bauman, and Moore all include criteria that direct researchers to select measures that will produce data that are *easily understood* and *"broadly acceptable" to both researchers and the general public.*

- ***"Statistical feasibility," "Common interpretation," "Forward looking," "Relationship to explanatory variables"***
  Researchers should consider, in advance, how the data collected using a specific measure will be used. Citro & Michael caution researchers to select measures that are "logically consistent" with each other and will allow for comparisons (e.g., across time periods and groups). Similarly, Bauman and Moore both note that when selecting measures researchers should pay close attention to whether they will serve as good predictors of poverty or material hardship, have a consistent interpretation across population subgroups, and provide effective baseline data for future trends.

- ***"Predicting long-term negative outcome[s]," "Positive outcomes," "Comprehensive coverage"***
  Selected measures should be related to well-established outcomes – both negative and positive (e.g., educational attainment, food insecurity). They also should assess well-being across an "array of outcomes, behavior and processes" (Moore, 1997).

- ***"Reliability," "Consistency over time," "Operational feasibility"***
  Measures should be reliable both in the short- and long-term. That is, they should consistently provide data that measures the same construct.

Beverly's (2001) criteria are somewhat narrower in focus and specifically relate to how measures of material hardship should be defined and operationalized. In her presentation at the Roundtable Meeting, Beverly focused her list of criteria on three specific recommendations. Material hardship measures should:

- ***Measure objective, rather than subjective conditions.***
  Both objective and subjective measures may be used to describe material need. In the latter case, subjective measures are self-assessments or evaluations of material need, whereas

objective measures capture facts about specific conditions or circumstances. As suggested by the definitional difference between material well-being and overall well-being, assessing material need is best done with objective indicators of living conditions, rather than subjective self-assessments or evaluations of these conditions. Researchers present at the Roundtable Meeting also noted that there are fundamental differences between actual experiences and perceptions of actual experiences and that direct measures of material hardship should focus on *actual* experiences.

However, most survey questions related to material need will always have an element of subjectivity due to the fact that the respondent reports the information. In some cases, this may lead to either "false positives" or underreporting. For example, in face-to-face interviews during the WES some interviewers noted that they saw mothers become visibly uncomfortable when they reported that their children had insufficient food. This led researchers to be concerned that the mothers might be underreporting food insufficiency in their household due to embarrassment or discomfort with admitting that they cannot provide for their children.

- ***Use direct measures of need that focus on consumption and short-term outcomes.***
  Direct measures should focus on consumption outcomes associated with material hardship, rather than mediating factors. For example, determining whether a person has health insurance captures data about the resources available to address unmet medical needs (indirect). In contrast, a question about whether an unmet need exists provides a direct assessment of a particular health outcome.

- ***To the extent possible, indicate the cause of hardship.***
  It is important to know why families experience hardship. For example, a hardship measure that reports hunger could mean that there are not enough resources to obtain necessary food, or that the respondent has reduced food intake for some other reason (e.g. a desire to lose weight). Measures of failure to obtain needed medical or dental care are even more vulnerable to this difficulty in interpretation. In the absence of information on "cause" it is difficult to know whether the hardship is "real" or the result of individual choices or preferences.

Additionally, in their presentations at the Roundtable Meeting, Connie Citro and Sondra Beverly both emphasized that hardship measures ought to be demonstrably linked to poor outcomes or well-being, and not to mediating factors. For example, it was pointed out that "lack of health insurance" is a mediating factor, not a direct hardship.

Exhibit 2.3

Suggested Criteria for Developing Material Hardship and Well-Being Measures
(Emphases added)

The Committee on National Statistics/Panel on Poverty and Family Assistance (Citro & Michael, 1995)	Recommendations for Measures of Material Hardship (Beverly, 2001)	Four Evaluation Techniques Used to Evaluate Hardship Measures (Bauman, 1998)	Criteria for Indicators of Child Well-being (Moore, 1997)
Public Acceptability: "A sensible cut-off. Some rationale that has face validity … understandable and broadly acceptable." ***Statistical Feasibility.*** "The measure must be logically consistent..[and]… allow for reasonable comparative analyses … across time, place, types of families, and population groups." ***Operational Feasibility.*** "Implies that data can be collected that will in fact measure the prevalence of the conditions underlying the concept of poverty."	Indicators of material hardship should assess **consumption of** the following goods and services: **food, housing, utilities, medical, clothing, and consumer durables**. Measures of material hardship should reflect **very basic standards of material adequacy**. To the extent possible, indicators should measure the **severity of hardship.** The core set of hardship measures should capture **objective, rather than subjective conditions.** The core set of hardship measures should consist of **direct, rather than indirect**, indicators. To the extent possible, hardship measures should indicate the **cause of hardship**. The core set of hardship indicators should include **composite indexes of hardship as well as separate measures**.	**Face validity**. Reasonable **relationship to explanatory variables** that are used to predict poverty. Utility in **predicting a long-term negative outcome** whose relation to family poverty has been well established (e.g., high school drop out). **Reliability**, measured by tracking measures over time and assessing sensitivity to sample selection and attrition bias.	***Comprehensive coverage***. Indicators should assess well-being across a broad array of outcomes, behavior and processes. ***Children of all ages.*** Age-appropriate indicators are needed at every age. ***Clear and comprehensible.*** The public should easily and readily understand indicators. ***Positive outcomes.*** Indicators should assess positive as well as negative aspects of well-being. ***Depth, breadth, and duration.*** Indicators are needed that assess dispersion across given measures of well-being, children's duration in status, and cumulative risk factors experienced by children. ***Common interpretation.*** Indicators should have the same meaning in varied population subgroups. ***Consistency over time.*** Indicators should have the same meaning across time. ***Forward-looking.*** Indicators should be collected now that anticipate the future and provide baseline data for subsequent trends. ***Reflective of Social Goals.*** Some indicators should allow us to track progress in meeting national, state and local goals.

Creating Summary Measures of Material Hardship

Many researchers have combined measures of material hardship to create a composite or summary measure (e.g., Beverly, 1999a; Federman et al., 1996; Mayer & Jencks, 1989; Rector et al., 1999). These composite measures may be formed *within* a dimension (e.g. insufficient food, number of housing problems) or *across* dimensions (combining housing problems and insufficient food). Composite or summary measures provide additional information on the concurrence of various hardships, but are at risk of obscuring detail seen in the individual components.

The key argument for constructing a summary measure is that it shows the extent of *overall* material hardship. A composite measure could rank hardship severity for families that are housing insecure, but not food insecure, and families that are food insecure, but not housing insecure. Individual measures provide no way to order these two groups of families. Still, collapsing the data in this way sacrifices information. If these types of families need different supports it may be important to distinguish them.

Furthermore, the process for constructing a summary measure is judgmental. Overall rankings vary depending on the items contained within a dimension, the dimensions included, and the weights used to combine dimensions. In the absence of a standard approach, comparisons may be difficult and disagreements about the extent of hardship likely.

A final disadvantage to composite measures is that they may have less face validity than individual measures. For example, insufficient money to pay the rent, or having the telephone disconnected for non-payment, are clearer on their face than a concept of overall material hardship. Aggregation *within* a dimension is more likely to have face validity than aggregation *across* dimensions. For example, "number of housing problems" is a summary measure but is nevertheless a clear concept to many. The justification for constructing a summary measure is strongest when there is a well-defined central idea or construct. The summary measure of food security, for example, was developed after extensive theoretical and empirical work on the interrelated concepts of food security, food insecurity, and hunger. Many researchers now use this measure; however, this measure continues to be controversial, with some critics questioning whether food insecurity measures provide useful information about hunger.

The disadvantages of summary measures of material hardship are mitigated if the individual components are presented as well. This is the approach generally taken in the literature. Typically the relationships among the indicators also are analyzed, and the discussion of key findings is based both on the composite and individual measures. Presenting both types of measures provides a sense of the extent to which findings based on the composite measure are robust to the approach used to construct the composite.

Technical Issues in Creating Summary Measures

Two general approaches are used for combining multiple indicators: indexes and scales. Indexes, the most commonly used approach to combining material hardship measures, are created using logic and judgment about what constitutes a "reasonable" set of indicators. In contrast, scales attempt to identify a set of "factors or principal components that are assumed to represent an underlying dimension of well-being that is not perfectly reflected by any single indicator" (Bauman, 2002a). An overview of Bauman's (2002a) summary of the comparative advantages and disadvantages of indexes, scales, and separate indicators is presented in Exhibit 2.4.

Both approaches must determine whether the summary measure should be continuous or categorical. For example, a continuous measure of material hardship might be constructed so as to take on values between 0 and 100. A categorical measure has a discrete number of hardship levels, with as few as two. An example of a categorical hardship measure is the USDA food security scale, which has three levels (food secure, food insecure-without hunger, food insecure-with hunger).

With either a categorical or continuous measure, analysts also may choose to set a threshold level, with hardship defined according to whether a family is above or below the threshold (analogous to the way poverty is typically defined). A threshold may be established based on judgment, or based on the distribution or correlation with an external measure. While a threshold provides a convenient summary, its use may entail the loss of valuable information. For example, two households might meet a threshold for being housing insecure, but one might be much worse off than another (e.g., homeless *versus* missing a rent payment). This drawback can be mitigated by providing more detailed results.

Exhibit 2.4

Bauman (2002a) Summary of Advantages and Disadvantages of Indexes, Scales, and Separate Indicators

Indexes		Scales		Subjective Evaluation of Separate Indicators	
Advantages	***Disadvantages***	***Advantages***	***Disadvantages***	***Advantages***	***Disadvantages***
• Simple to construct – only need a "reasonable" set of indicators of a specific contract to be put together. • Improves measurement over the use of a single indicator in that it lowers measurement error (assuming index is well-constructed). • The index approach established by Mayer and Jencks (1989) has been validated and used as a model for indexes in other research (e.g., (Mirowsky & Ross, 1999; Short & Shea, 1995).	• Lack of agreement on a set of criteria for choosing items. • There may be an indeterminate number of items to be included in an index. • Different numbers of items can result in different scores and weights for different components of the index. • Even if researchers agree to use a standard set of items, there is still the challenge of producing acceptable and valid weights. • Using an index throws away potentially useful information about the severity of the items used.	• Allows researchers to identify a "latent class" or underlying definition of a construct (e.g., material hardship). • One strategy allows researchers to look at correlations between indicators to arrive at a set of factors (i.e., principle components) that are assumed to represent an underlying dimension of well-being not perfectly reflected by any single indicator. This avoids may of the disadvantages associated with an index.	• Intercorrelations between indicators may be attenuated by substitution or selective applicability. • Relationships between variables are causal, or related to causal processes. This makes interpreting the model more complicated.	• Avoids problems of weighting and ignoring severity, as found when developing indexes. • Avoids problems of ignoring causal relationships. • Face validity of specific measures.	• Analyst must make subjective evaluations about the reliability and validity of the individual items and take into account offsetting errors when examining a set of unsummarized indicators. • May present difficulties in ranking people consistently – that is, we don't know when someone is definitely "worse off" when the set of indicators changes.

Summary Measures of Material Hardship Based on Logic and Judgment (Indexes)

When developing *indexes* of material hardship, indicators or dimensions chosen by the researcher are often combined simply by summation, with each component receiving the same weight. Weights are sometimes assigned based on the perceived importance or relevance to respondents of each component. Low frequency of a given hardship in the population indicates the degree to which a component is a necessity, in that the higher the proportion of households with a particular item (or that do not experience a particular hardship), the greater the extent to which the item may be deemed to be a necessity. Thus, lacking a refrigerator may be given greater weight than lacking an automatic dishwasher.

Mayer and Jencks (1989) created an index that was weighted according to the separate indicators' relative importance to the families that experience hardship. Weights were developed by regressing respondents' answers to a question on how families felt about their standard of living on the researchers' 10 hardship measures. Nonetheless, Mayer and Jencks ultimately reported their results in terms of unit weights (measured on the total number of hardships a respondent reported) because it was easier to interpret.

Despite the *ad hoc* nature of this approach, it is possible to use statistical techniques to validate indexes and similar summary measures to provide confidence in the soundness of the approach. In the paper mentioned above by Mayer and Jencks (1989) their approach has been validated (Bauman, 1998) and has been the model of indexes used in other research (Mirowsky & Ross, 1999; Short & Shea, 1995).

Exhibit 2.5 lists example studies that illustrate this general approach; however, it is important to note that there are numerous other studies that have used this approach.

Exhibit 2.5

Examples of Summary Measures Based on Logic and Judgment

(Mayer & Jencks, 1989). Based on two telephone surveys of Chicago households, the authors construct an index using the total number of hardships reported per family, out of eight dichotomous hardships relating to food, housing, and medical care. Each component is weighted equally in the total (i.e., unit weighted).[3] The value of their summary measure therefore varies from zero to eight.

(Federman et al., 1996). Using SIPP data, the authors construct an index that is the total number of deprivations reported out of nine dichotomous indicators relating to food, housing, utilities, and appliances. Each component is implicitly weighted equally.

(Rector et al., 1999). The authors use SIPP data to construct a composite hardship measure based on a combination of specific hardship indicators and income in relation to the poverty threshold. Specifically, the authors define persons to have "overall material hardship" if they live in households with incomes below 200 percent of the official poverty threshold, and they have one or more "substantial" hardships or three or more "moderate" problems.

(Beverly, 1999a). Using SIPP data, the author constructs a primary hardship index as the sum of six equally-weighted dichotomous indicators relating to food security, housing, utilities, and medical need. The author also defines a threshold: a family is in hardship if it experiences any one of the individual indicators.

(Martinez & Ruiz-Huerta, 2000). Using data for Spain from the European Community Household Panel survey, the authors aggregate 20 dichotomous hardship indicators into four dimensions: maintenance (measures of current financial strain); durable goods; housing conditions; and lifestyle (e.g., ability to save, ability to buy furniture). The authors use weighted sums to combine the 20 items into four dimensions, where the weights are based on the proportion of individuals not lacking an item. The indexes are constructed to vary between 0 and 100. The authors construct a total hardship index by taking a weighted sum of the four dimensional indexes, where the weights are based on the average weight within each dimension. The authors also construct a basic hardship index, analogous to the total index but including only items lacked by less than half the population.

(Martinetti, 2000). Using data from 1994 survey of Italian households, Martinetti uses "fuzzy sets" theory to combine individual hardship indicators—some dichotomous, some categorical—into five dimensions: housing, health, education, social interactions, and psychological conditions. In combining the indicators within dimensions, the author uses different approaches for each dimension, including: weight averaging with weights based on the frequency of the hardship; weight averaging with unit weights; and taking the union of dichotomous indicators. Martinetti also constructs an overall hardship index combining the five dimensions.

(Muffels & Fourarge, 2003). Using data for 12 countries from the European Community Household Panel survey, the authors aggregate 21 dichotomous hardship indicators into a total hardship index. The 21 indicators reflect health conditions, financial stress, housing conditions, and possession of durables. The indicators are combined into a total hardship index using a weighted sum, where the weights for each indicator are based on the proportion of individuals not deprived by that indicator.

Summary Measures of Material Hardship Based on Statistical Approaches (Scales)

An alternative to a judgment-based approach to creating summary measures of hardship is to use statistical methods to select indicators, group indicators into dimensions, and to create weights. Methods such as cluster analysis, correspondence analysis, latent class analysis and factor analysis

[3] In the same paper, Mayer and Jencks use a statistical test to determine whether unit weighting is appropriate, and find that it is.

can be used to aggregate indicators into groups (based on their mutual correlations), with weights determined by the statistical model. Weights also may be based on rarity or on correlation with an external measure of the construct. Items that are found to represent different dimensions are dropped from the scale. The statistical or modeling approach, however, does not eliminate the need to make assumptions and subjective decisions.

Exhibit 2.6 lists example studies that illustrate this general approach; numerous other studies have been done.

Exhibit 2.6

Examples of Summary Measures Based on Statistical Approaches

(Bickel, Nord, Price, Hamilton, & Cook, 2000). The authors provide a methodology for measuring household food security using 18 indicators collected via survey (or using a set of 6 indicators). A statistical approach known as a Rasch model was used to select the 18 indicators from a larger set, and to develop a scale that translates the number of affirmative responses into an equal interval scale that can be manipulated mathematically (e.g., mean scale scores can be computed). The scale scores are also used to assign households to one of four different levels of food security (food secure; food insecure without hunger; food insecure with hunger, moderate; and food insecure with hunger, severe). The food security scale is an example of aggregation within a particular dimension of material hardship, not an aggregation across dimensions.

(Bauman, 2002a). Using SIPP data, the author attempted to construct a material hardship scale using latent class analysis. Bauman examined the relationship between the latent classes and poverty to see whether a natural ordering of classes existed, and tested the degree to which the classes captured the information about poverty in the individual indicators. Based on his analysis, the author did not find strong support for a scale summarizing material hardship.

(Layte, Maitre, Nolan, & Whelan, 1999). Using data from the European Community Household Panel survey, the authors use factor analysis to cluster 25 dichotomous indicators of material hardship into five distinct groups: basic lifestyle deprivation (e.g., food, clothing), secondary lifestyle deprivation (e.g., car, telephone), housing facilities, housing deterioration, and environmental problems (e.g., noise, vandalism). The authors calculate a value for each household in each group by summing the number of indicators on which the household is deprived. The authors also construct an overall hardship index as the unit-weighted sum of the 25 indicators.

(Gundersen, 1996). In contrast to the other studies summarized in this section, the author uses a model-based approach to create a summary measure of hardship. Gunderson begins by developing an axiomatically-derived model of hardship, which he refers to as a "well-being evaluation function." Using data from the American Housing Survey, the author applies the model to develop "housing evaluation functions." Each function uses a different functional form to aggregate three indicators of housing quality (adequacy, comfort, and neighborhood) into an overall measure of housing hardship. (This is an example of aggregation within a dimension rather than across dimensions.)

Summary

Researchers and policymakers who are interested in measuring material hardship are faced with the definitional and operational challenges of: 1) conceptualizing and defining hardship; and 2) measuring families' hardship experiences and creating composite measures that summarize these experiences across domains (e.g., food, shelter, medical care). Research to date by European and, to a lesser extent, domestic researchers suggests an approach for developing a common definition of material need and identifying a standard below which people experience material hardship. Specifically, we are most interested in:

- Directly assessing the extent to which people have the basic goods and services they need after using all of the resources at their disposal;
- Minimizing the role played by individual choice and preferences when defining material need; and
- Learning whether people succeed in meeting a given set of socially defined needs, regardless of individual choice. This may be accomplished by focusing on a core set of basic needs that is fairly closely related to physiological functioning.

These principles, however, are a starting point for discussion. There are still different viewpoints as to what constitutes material need, and corresponding thresholds for identifying material hardship. Additionally, there are other aspects of measurement and analysis that require consideration. These include:

- Choosing appropriate constructs for measuring need;
- Selecting reliable and valid measures; and
- Deciding how to summarize a wide array of potential measures into a smaller, more manageable number of measures, or possibly a material hardship index.

A number of researchers have tackled these issues and developed approaches for measuring material hardship. In the next chapter we compare the features of nine studies that have defined and measured material hardship using an index.